

WHAT IS CLAIMED IS:

1. For use with a polishing apparatus, a polishing endpoint
detection system, comprising:

a carrier head having a polishing platen associated therewith;
a signal emitter located adjacent one of said carrier head or
polishing platen, said signal emitter configured to generate an
emitted signal capable of traveling through an object to be
polished; and

a signal receiver located adjacent another of said carrier
head or polishing platen and configured to receive said emitted
signal from which a change in a signal intensity of said emitted
signal can be determined.

2. The system as recited in Claim 1 wherein said signal
emitter is located adjacent said carrier head and said signal
receiver is located adjacent said polishing platen.

3. The system as recited in Claim 1 wherein said signal
emitter is located adjacent said polishing platen and said signal
receiver is located adjacent said carrier head.

4. The system as recited in Claim 1 wherein said emitted

2 signal is comprised of acoustic waves.

5. The system as recited in Claim 4 wherein said acoustic
2 waves are ultrasonic.

6. The system as recited in Claim 1 wherein said emitted
2 signal is comprised of acoustic waves having a plurality of
3 frequencies and wherein said signal receiver is configured to
4 receive said emitted signal from which a change in a signal
5 intensity of each of said plurality of acoustic waves can be
6 determined.

7. The system as recited in Claim 1 wherein said signal
intensity includes a signal characteristic selected from the group
consisting of:

4 a signal wavelength, and

5 a signal amplitude.

8. A method of determining a polishing endpoint of a surface located on a semiconductor wafer, comprising:

emitting a first signal from an emitter located adjacent one of a carrier head or a polishing platen and causing said first signal to pass through a polished film located on a semiconductor wafer, and thereby provide a second signal having a signal intensity less than a signal intensity of said first signal;

receiving said second signal emanating from said film with a receiver located adjacent another of said carrier head or said polishing platen; and

determining a polishing endpoint for said film as a function of a change of intensity between said first and second signals.

9. The method as recited in Claim 8 wherein said emitting a first signal includes emitting a first signal from a signal emitter located adjacent said carrier head and said receiving said second signal includes receiving said second signal with a signal receiver located adjacent said polishing platen.

10. The method as recited in Claim 8 wherein said emitting a first signal includes emitting a first signal from a signal emitter located adjacent said polishing platen and said receiving said second signal includes receiving said second signal with a signal

5 receiver located adjacent said carrier head.

11. The method as recited in Claim 8 wherein said emitting a
2 first signal includes emitting a first signal comprised of acoustic
3 waves.

12. The method as recited in Claim 11 wherein said emitting
2 a first signal comprised of acoustic wavers includes emitting a
3 first signal comprised of ultrasonic acoustic waves.

13. The method as recited in Claim 8 wherein said emitting a
first signal includes emitting a first signal comprised of acoustic
waves having a plurality of frequencies and wherein said
determining includes determining a polishing endpoint for said film
as a function of a change of intensity of each of said plurality of
acoustic waves between said first and second signals.

14. The method as recited in Claim 8 wherein said determining
2 includes determining a polishing endpoint for said film as a
3 function of a change of a signal wavelength or a signal amplitude
4 between said first and second signals.

15. A method of manufacturing an integrated circuit,
2 comprising:

3 forming an integrated circuit layer on a semiconductor wafer;
4 polishing said integrated circuit layer with a polishing
5 apparatus having a carrier head and a polishing platen associated
6 therewith;

7 determining a polishing endpoint of said integrated circuit
8 layer, including:

9 emitting a first signal from an emitter located adjacent
10 one of said carrier head or said polishing platen and causing said
11 first signal to strike said integrated circuit layer, and thereby
12 provide a second signal having a signal intensity less than a
13 signal intensity of said first signal;

14 receiving said second signal emanating from said
15 integrated circuit layer with a receiver located adjacent another
16 of said carrier head or said polishing platen; and

17 determining said polishing endpoint as a function of a
18 difference of intensity between said first and second signals.

16. The method as recited in Claim 15 wherein said second
2 signal is a resulting signal that results from said first signal
3 striking said integrated circuit layer.

17. The method as recited in Claim 15 wherein said emitting
a first signal includes emitting a first signal from a signal
emitter located adjacent said carrier head and said receiving said
second signal includes receiving said second signal with a signal
receiver located adjacent said polishing platen.

18. The method as recited in Claim 15 wherein said emitting
a first signal includes emitting a first signal from a signal
emitter located adjacent said polishing platen and said receiving
said second signal includes receiving said second signal with a
signal receiver located adjacent said carrier head.

19. The method as recited in Claim 15 wherein said emitting
a first signal comprised of acoustic wavers includes emitting a
first signal comprised of ultrasonic acoustic waves.

20. The method as recited in Claim 15 wherein said emitting
a first signal includes emitting a first signal comprised of
acoustic waves having a plurality of frequencies and wherein said
determining includes determining a polishing endpoint for said
integrated circuit layer as a function of a change of intensity of
each of said plurality of acoustic waves between said first and
second signals.

21. The method as recited in Claim 15 wherein said
determining includes determining a polishing endpoint for said
integrated circuit layer as a function of a change of a signal
wavelength or a signal amplitude between said first and second
signals.